of yeast cells. When possible they used the potassium permanganate titration method for determining catalase activity. In cases where additions of thymol, glucose, etc., rendered the permanganate method inaccurate, the volumetric method was used. They used mainly their cultures of distillery top yeast S.B. II. Some experiments were run with brewery bottom yeast. They agree with PHRAGMEN's findings that yeast splits dilute solutions of hydrogen peroxide without secreting a soluble enzyme into the bathing fluid. The reaction is one of the first order. The reaction constant increases in proportion to the amount of yeast. Small amounts of protoplasmic poisons (toluol or chloroform) raise the catalase activity of these cells 6-fold. When cells were dried in the air or otherwise without injuring them, the catalase activity rose 10–15-fold. When emulsions of the yeast were heated 0.5–2 hours at 55–63° C., the catalase activity rose 20–30-fold. The activation by heating is greatly influenced by reagents in the emulsion at the time of heating. Similar activation of catalase has been demonstrated in a number of other micro-organisms. The catalase activity of yeast can be raised by previous treatment with sugar solutions. This increased catalase activity is not due to increased permeability of the cells to catalase, but is an activation within the living cells. The reaction constant is not a measure for the catalase content of the cells.—WM. CROCKER.

Parasitism.—HAWKINS and HARVEY[15] have made an interesting study of the nature of the resistance of White McCormick tubers to the tuber rot caused by *Pythium debaryanum* Hesse. The White McCormick is very resistant to the disease, while Bliss, Triumph, and Green Mountain are very susceptible. From their experiments they think it probable that the fungus enters the cells of the potato by mechanical puncture of the cell walls and not by enzyme action. The McCormick is less susceptible to the disease than the other varieties, because its cell walls are more resistant to this mechanical puncture. Determinations of the pressure required to puncture the cell walls give much higher results for the McCormick than for the susceptible varieties. The rate of growth of the fungus is much slower in the McCormick. Correlated with the greater resistance of the McCormick is a higher crude fiber content. If its osmotic pressure is to be considered the force available to the fungus for this mechanical puncture of the cell walls, then the cases of resistance of the potatoes used in the experiments would be explained, with three exceptions.—S. V. EATON.

Correlations.—CHILD and BELLAMY[16] have done a very interesting piece of work on correlations in plants. They can break up correlation effects by

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[15] HAWKINS, L. A., and HARVEY, R. B., Physiological study of the parasitism of *Pythium debaryanum* Hesse on the potato tuber. Jour. Agric. Res. **18**:275–297. *pls.* 35–37. *figs.* 2. 1919.

[16] CHILD, C. M., and BELLAMY, A. W., Physiological isolation by low temperature in *Bryophyllum* and other plants. Science **50**:362–365. 1919.

cooling 2–3 cm. zones of petioles and stems to a temperature of 2.5–3° C. In *Bryophyllum*, when such zones of the petiole are cooled, the broken correlation is manifested by development, not only in the notches of the leaf treated, but by development in the notches of the opposite leaf, as well as leaves both up and down the stem. The effect extends farther in the basal direction than in the apical. This indicates marked complexity in the correlation inhibitive effects. In *Phaseolus* the axial buds below the cooled zone grew. In *Saxifraga sarmentosa* the runner tip could be thus isolated. All of these results favor McCallum's view that correlative effects are brought about by conduction of stimuli, mainly inhibitory stimuli, and not by movements of materials.—Wm. Crocker.

Fermentation.—Euler and Svanberg[17] made a study of alcoholic fermentation in an alkaline medium in which P=8. Top yeast and *Torula* gave about equal weights of carbon dioxide and alcohol, each equal to 30–33d of the weight of the sugar fermented. Glucose, fructose, and invert sugar were fermented with about equal speed, mannose about 30 per cent as fast, and galactose very slowly. Invertase is active in this medium and maltase inactive. The following are the maximum alkalinities in which cell division occurs in the various yeasts: Frohberg Unterhefe B., $P_H=7.7–8$; Brennerei Oberhefe S.B. II, $P_H=7.3–8.4$; *Sacch. ellipsoideus*, $P_H=7.9$; *Pseudosacch. apiculatus*, $P_H=7.6$. Increase in weight occurred in S.B. up to $P_H=8.5$. For Frohberg Unterhefe H the full curve of acid sensitivity was worked out and the optimum was found to be at $P_H=5$.—Wm. Crocker.

Exudation of water by leaves.—Miss Flood[18] has recently investigated the exudation of extremely pure water by the leaf tips of *Colocasia antiquorum*. Examination of sections of leaf tips showed no membrane, or other structure which might act as a filter, between the vascular system of the leaf blade and the pores leading to the tip. Solutions of India ink, gelatine, and starch were forced through the vascular system and exuded at the tips. Exudation from leaves attached to the plant continued at the normal rate when leaf tips were anaesthetized. Miss Flood is of the opinion that cells lower down in the plant are responsible for the secretion and filtration of water, but finds no evidence for the existence of such cells except in the root.—J. M. Arthur.

Colorado grasslands.—Reviewing the investigations of the grasslands of Colorado by himself and others, Ramaley[19] enumerates all the associations

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[17] Euler, H., and Svanberg, O., Enzymatische Studien über Zuckerspaltungen. Hoppe-Seyler Zeit. Physiol. Chem. **105**:187–239. 1919.

[18] Flood, Margaret G., Exudation of water by *Colocasia antiquorum*. Proc. Roy. Dublin Soc. (N.S.) **15**: *pls. 2*. 1919.

[19] Ramaley, Francis, Xerophytic grasslands at different altitudes in Colorado. Bull. Torr. Bot. Club **46**:37–52. *figs. 2*. 1919.